

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte BOB W. STEWART

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Appeal No. 1997-0030  
Application No. 08/180,767

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ON BRIEF

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Before STAAB, McQUADE, and CRAWFORD, Administrative Patent Judges.

STAAB, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 1, 2, 4-17 and 19-32, all the claims pending in the application.

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Appellant's invention pertains to "an apparatus . . . for providing two or more predetermined wavelengths of laser radiation for coaxial transmission and simultaneous use, and, more particularly, to a metal vapor laser system for providing a single output laser light beam having a predetermined mixture of wavelengths for simultaneous medical use" (specification, page 1). Independent claim 1, a copy of which is found in an appendix to appellant's brief, is representative of the appealed subject matter.

The references of record relied upon by the examiner as evidence of obvious are:

Schachar et al. (Schachar)	4,520,816	June 4,
1985		
Kung et al. (Kung)	5,180,378	Jan. 19,
1993		

Piper	WO87/06775	Nov. 5, 1987
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B.G. Bricks et al. (Bricks), "An Investigation of a Discharge-Heated Barium Laser," J. Appl. Phys., vol. 49, no. 1, 38-40(January 1978).

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Ph. Cahuzac (Cahuzac), "Emissions Laser Infrarouges Dans Les Vapeurs De Thulium ET D'ytterbium," vol. 27A, no. 8, 473-474, (September 9, 1968).<sup>1</sup>

The following rejections under 35 U.S.C. § 103 are before us for review:

a) claims 1, 5, 7, 24 and 29, unpatentable over Piper in view of Kung;

b) claims 2, 4, 13, 15, 25 and 30-32, unpatentable over Piper in view of Kung, and further in view of Bricks;

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<sup>1</sup> Our understanding of this French language publication is derived from a translation prepared in the Patent and Trademark Office. A copy of the translation is attached to this decision.

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c) claims 6, 11, 12, 14, 19, 21-23, 26-28<sup>2</sup>, unpatentable over Piper in view of Kung, and further in view of Bricks and Schachar;

d) claims 8-10, 16<sup>3</sup> and 30-32, unpatentable over Piper in view of Kung, and further in view of Cahuzac;

e) claim 17, unpatentable over Piper in view of Kung, and further in view of Bricks and Cahuzac; and

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<sup>2</sup> Although the cover sheet of the final rejection indicated that claim 28 was finally rejected, neither the final rejection nor the answer includes claim 28 in the statement of any of the rejections. Upon review of the record, it reasonably appears that the examiner intended to reject claim 28 on the same evidentiary basis as claim 26, from which it depends. Accordingly, we have included claim 28 in this rejection. In light of our decision in this appeal, appellant is not prejudiced by our addition of claim 28 to this rejection.

<sup>3</sup> The rejection of claim 16 as being unpatentable over Piper in view of Kung and further in view of Cahuzac is a new ground of rejection of this claim made for the first time in the examiner's answer.

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f) claim 20, unpatentable over Piper in view of Kung<sup>4</sup>, and further in view of Bricks, Schachar and Cahuzac.

The rejections are explained in the examiner's answer (Paper No. 22) and the supplemental examiner's answer (Paper No. 27).

The opposing viewpoints of appellant are set forth in the brief (Paper No. 21), the reply brief (Paper No. 23), and the "Response to New Grounds of Rejection" (Paper No. 24).

Representative claim 1 is directed to a multiple wavelength laser system comprising an active laser gain medium comprising metal vapor, means for exciting the medium to produce laser radiation at a plurality of wavelengths, means for coaxially transmitting laser radiation at a plurality of

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<sup>4</sup> On pages 5-6 of the answer, the evidentiary basis for this rejection is stated to be "Piper in combination with Bricks et al and Schachar et al as applied to claim 19 above, and further in view of Cahuzac." Since Kung was part of the evidentiary basis for the rejection of independent claim 19, and since claim 20 depends from claim 19, we consider that the examiner inadvertently failed to include Kung in the statement of the rejection of claim 20 on pages 5-6 of the answer.

wavelengths for simultaneous use in a medical procedure, and "means for controlling populations of multiple lasing energy level transitions to thereby control relative intensities among the coaxially transmitted wavelengths, thereby to providing a means for controlling total intensities of such transmitted wavelengths." Each of claims 13, 19 and 29, the other independent claims on appeal, contains similar limitations.

The examiner considers that Piper discloses a device as set forth in claim 1 except for the means for controlling the relative intensities of the transmitted wavelengths. The examiner further considers that Kung discloses controlling the intensity of each of a plurality of coaxially transmitted laser beams and the ratio thereof. Based on the above, it is the examiner's foundation position that it would have been obvious to one of ordinary skill in the art to include in Piper a means for controlling the individual intensities of the metal vapor laser thereof "since this enables the treatments to be carried out under the most desirable irradiating conditions, as taught by Kung" (answer, page 3).

Implicit in the above is the examiner's determination that the thus modified device of Piper would correspond to the subject matter of claim 1 in all respects.

Piper, the examiner's primary reference, is directed to a dye laser "intended for the production of a pulsed light output at a particular wave length" (page 1, lines 3-5). One particular application of the dye laser of Piper is in the treatment of tumors previously labeled with suitable dyes (page 1, lines 22-29). In this situation, the wavelength "must be chosen within narrow limits established by the need to obtain adequate penetration of the tissue and by the fact that the wavelength must lie within the absorption band of the dye used to label the tumor" (page 2, lines 6-9). To this end, Piper teaches a means for controlling the output of a laser by preferentially stimulating the emission of a particular wavelength (page 4, lines 27-33). In particular, Piper provides a single laser discharge tube containing different active media (e.g., copper and gold) such that the output of the tube contains frequencies characteristic of each media. In one example, illustrated in Figure 2, Piper

achieves a two stage amplification of the gold laser output as follows:

The wavelength selective properties of mirror 1 allow transmission of the copper laser output at 511 and 578nm to mirror 2 whilst directing the gold laser output through the spatial filter 3 and thence into the transversely pumped dye cell amplifiers 4 and 5. Approximately one third of the copper laser output is directed by mirror 6 and focussing lens 7 into the dye cell 4. In this way the weak gold laser radiation at 628nm emitted by the discharge tube passes through two stages of amplification and results in a beam of substantial output power which is frequency locked to the 628nm line. [Page 6, lines 4-14.]

Thus, Piper teaches seeding a dye laser with a wavelength produced by a first metal (e.g., gold) while pumping the dye laser with a wavelength produced by a second metal (e.g., copper) to produce an amplified single wavelength output at a wavelength corresponding to the seed wavelength of the first metal. Accordingly, it is clear that Piper teaches using only a single wavelength of a metal vapor laser at the output of the laser treatment system.



Kung's surgery laser system is similar to appellant's in that the objective is to provide a single output laser light beam having a predetermined mixture of wavelengths, wherein the relative proportions of the wavelengths may be varied to achieve a desired result, e.g., cutting and coagulating (column 1, line 62 through column 2, line 3). The Kung system includes a solid state Nd:YAG laser 10 in combination with a Raman laser cell to generate a laser light beam having the desired wavelengths (column 2, line 52 through column 3, line 17). An output coupling device, such as partially reflective mirrors  $M_1$ ,  $M_2$  and  $M_3$  or a piezo-electrically controlled interference filter, not shown, is employed to vary the relative proportions of the light of each wavelength (column 4, lines 44-56; column 6, line 44-64).

Given Piper's objective of producing a pulsed light output at a *particular wavelength* (page 1, lines 3-5) in order to *closely match* the absorption band of the dye used to label the tumor to be treated (page 2, lines 5-11), it is apparent that one of ordinary skill in the art would not provide means

for controlling relative intensities of plural wavelengths of the end output laser beam of Piper. In this regard, since the output of Piper is of a *particular wavelength*, there would be no plural wavelengths to control. Moreover, modifying Piper's system to provide an output having plural wavelengths would run counter to Piper's expressly stated objective of providing an output of a particular wavelength that is closely matched to the absorption band of the marker dye used to label the tumor.

As to providing means for controlling the relative intensities of the plural wavelengths at a location *internally* of Piper's system (e.g., at a location between the laser discharge tube containing different active media and mirror 1), we appreciate that between the laser discharge tube and the mirror 1 Piper's light beam comprises plural wavelengths. Nevertheless, we view such a modification of Piper to be based on impermissible hindsight rather than on anything fairly taught by Piper and/or Kung. In the first place, there is no suggestion in Piper or Kung that Piper's system might be

inadequate for its intended purpose, or that Piper's system would benefit from having an output coupling of the type disclosed in Kung provided at this location. Further, the way in which Kung's output coupling device (e.g., selectively reflective mirror  $M_3$  or piezo-electrically controlled interference filter) functions to vary the light of each wavelength depends to a large extent on the nature of the Raman laser cell to which it is coupled. In short, it is not apparent to us where in the combined teachings of Piper and Kung one of ordinary skill in the art would have found a teaching of "controlling populations of multiple lasing energy level transitions" to thereby control relative intensities, as called for in the last paragraph of claim 1.

Where prior art references require a selective combination to render obvious a claimed invention, there must be some reason for the combination other than hindsight gleaned from the invention disclosure, *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). In the fact situation before us, we are unable to

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agree with the examiner that one of ordinary skill in the art would have been motivated by the combined teachings of Piper and Kung to incorporate a output coupling device into the laser system of Piper in a manner which would have resulted in a "means for controlling populations . . ." as called for in the last paragraph of claim 1.

In light of the above, the examiner's rejection of claims 1, 5, 7, 24 and 29 as being unpatentable over Piper in view of Kung cannot be sustained. As to the remainder of the examiner's rejections, we have considered the Bricks, Schachar and Cahuzac references additionally relied upon by the examiner in these rejections but find nothing therein which makes up for the deficiencies of Piper and Kung discussed above. Accordingly, these rejections also cannot be sustained.

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The decision of the examiner is reversed.

REVERSED

LAWRENCE J. STAAB	)	
Administrative Patent Judge)	)	
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	)	BOARD OF PATENT
JOHN P. McQUADE	)	APPEALS
Administrative Patent Judge)	)	AND
	)	INTERFERENCES
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MURRIEL E. CRAWFORD	)	
Administrative Patent Judge)	)	

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